CLAIMS

We claim:

1. A light-emitting device comprising:

a heterostructure of semiconductor materials having at least one p and one n-type layer; and

a p and an n contact, the p contact electrically connected to the p-type layer, the n contact electrically connected to the n-type layer, wherein one of the p and n contacts is a multi-layer contact having at least one ohmic contact layer and one reflector layer.

2. A device, as defined in claim 1, wherein the multi-layer contact has a reflectivity greater than 75%.

3. A device, as defined in claim 1, wherein the multi-layer contact has a specific contact resistance less than 10^{-2} Ω-cm^2.

4. A device, as defined in claim 1, the multi-layer contact further comprising a barrier layer interposing the ohmic contact layer and the reflector layer.

5. A device, as defined in claim 1, wherein the reflector layer has a thickness greater than 500Å.

6. A device, as defined in claim 1, wherein the ohmic contact layer has a thickness less than 200Å.

7. A device, as defined in claim 1, wherein the reflector layer is selected from a group that includes Al, Cu, Rh, Pd, and Au.

8. A device, as defined in claim 1, whereinthe p and n contacts are on opposing faces of the heterostructure.

9. A device, as defined in claim 8, wherein the ohmic contact layer includes Ni and Ag.

10. A device, as defined in claim 8, wherein the reflector layer is Ag.

11. A light-emitting semiconductor device comprising a GaN-based heterostructure having at least one p and one n-type layer;

a p and an n contact, the p contact electrically connected to the p-type layer, the n contact electrically connected to the n-type layer, wherein one of the p and n contacts is a multi-layer contact having at least one ohmic contact layer and one reflector layer.

12. A device, as defined in claim 11, wherein the multi-layer contact has a reflectivity greater than 75%.

13. A device, as defined in claim 11, wherein the multi-layer contact has a specific contact resistance less than 10^{-2} Ω-cm^2.

14. A device, as defined in claim 11, the multi-layer contact further comprising a barrier layer interposing the ohmic contact layer and the reflector layer.

15. A device, as defined in claim 11, the reflector layer having a thickness greater than 500Å.

16. A device, as defined in claim 11, the ohmic contact layer having a thickness less than 200Å.

17. A device, as defined in claim 11, the reflector layer being selected from a group that includes Al, Cu, Rh, Pd, and Au.

18. A device, as defined in claim 11, wherein the ohmic contact layer is selected from a group that consists of Ti, Au/NiO, and Ni/Au.

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